High-speed Switching Transistor(−60V / −5A)

2SA1952 / 2SA1906 / 2SA1757

●Features

1) High switching speed, typically tf=0.15 μs at Ic=−3A.
2) Low saturation voltage,typically $V_{CE(sat)}$=−0.2V at Ic / IB=−3A / −0.15A.
3) Wide SOA. (safe operating area)
4) Complements the 2SC5103 / 2SC4596.

●Packaging specifications and hFE

Type	2SA1952	2SA1906	2SA1757
Package	CPT3	PSD3	TO-220FP
hFE	Q	DEF	F
Code	TL	TL	—
Basic ordering unit (pieces)	3000	1000	500

●Absolute maximum ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	−100	V
Collector-emitter voltage		V_{CEO}	−60	V
Emitter-base voltage		V_{EBO}	−5	V
Collector current		Ic	−5	A
			−10	A (Pulse)
Collector power dissipation	2SA1757	Pc	1	W
			10	W(Tc=25℃)
	2SA1952		1.5	W
			2.5	W(Tc=25℃)
	2SA1757, 2SA1906		2	W
			25	W(Tc=25℃)
Junction temperature		Tj	150	℃
Storage temperature		Tstg	−55～+150	℃

●Electrical characteristics (Ta=25℃)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage		BV_{CBO}	−100	—	—	V	Ic=−50 μA
Collector-emitter voltage		$BV_{CEO(SUS)}$	−60	—	—	V	Ic/IB=−3A/−0.3A, L=1mH
Collector-emitter breakdown voltage		BV_{CEO}	−60	—	—	V	Ic=−1mA
Emitter-base breakdown voltage		BV_{EBO}	−5	—	—	V	IE=−50 μA
Collector cutoff current		I_{CBO}	—	—	−10	μA	VCB=−100V
Emitter cutoff current		I_{EBO}	—	—	−10	μA	VEB=−5V
Collector-emitter saturation voltage		$V_{CE(sat)}$	—	—	−0.3	V	Ic/IB=−3A/−0.15A
			—	—	−0.5	V	Ic/IB=−4A/−0.2A
Base-emitter saturation voltage		$V_{BE(sat)}$	—	—	−1.2	V	Ic/IB=−3A/−0.15A
			—	—	−1.5	V	Ic/IB=−4A/−0.2A
DC current transfer ratio	2SA1952	hFE	120	—	270	—	VCE=−2V , Ic=−1A
	2SA1906		60	—	320	—	
	2SA1757		160	—	320	—	
Transition frequency		fT	—	80	—	MHz	VCE=−10V , IE=0.5A , f=30MHz
Output capacitance		Cob	—	130	—	pF	VCB=−10V , IE=0A , f=1MHz
Turn-on time		ton	—	—	0.3	μs	Ic=−3A , RL=10Ω
Storage time		tstg	—	—	1.5	μs	IB1=−IB2=−0.15A
Fall time		tf	—	—	0.3	μs	VCC≒−30V

(96-603-A314)

High-speed Switching Transistor(60V / 5A)

2SC5103 / 2SC4596

●Features

1) Low saturation voltage, typically $V_{CE(sat)}$=0.15V at Ic/IB=3A / 0.15A
2) High switching speed, typically tf=0.1 μs at Ic=3A.
3) Wide SOA. (safe operating area)
4) Complements the 2SA1952 / 2SA1757.

●Packaging specifications and hFE

Type	2SC5103	2SC4596
Package	CPT3	TO-220FP
hFE	PQ	EF
Code	TL	—
Basic ordering unit (pieces)	2500	500

●Absolute maximum ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	100	V
Collector-emitter voltage		V_{CEO}	60	V
Emitter-base voltage		V_{EBO}	5	V
Collector current		Ic	5	A (DC)
			10	A (Pulse) ✻
Collector power dissipation	2SC5103	Pc	1	W
			10	W(Tc=25℃)
	2SC4596		2	W
			25	W(Tc=25℃)
Junction temperature		Tj	150	℃
Storage temperature		Tstg	−55～+150	℃

✻ Single pulse Pw=100ms

●Electrical characteristics (Ta=25℃)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage		BV_{CBO}	100	—	—	V	Ic=50 μA
Collector-emitter voltage		$BV_{CEO(SUS)}$	60	—	—	V	Ic/IB=3A/0.3A, L=1mH
Collector-emitter breakdown voltage		BV_{CEO}	60	—	—	V	Ic=1mA
Emitter-base breakdown voltage		BV_{EBO}	5	—	—	V	IE=50 μA
Collector cutoff current		I_{CBO}	—	—	10	μA	VCB=100V
Emitter cutoff current		I_{EBO}	—	—	10	μA	VEB=5V
Collector-emitter saturation voltage		$V_{CE(sat)}$	—	0.15	0.3	V	Ic/IB=3A/0.15A ✻
			—	—	0.5	V	Ic/IB=4A/0.2A ✻
Base-emitter saturation voltage		$V_{BE(sat)}$	—	—	1.2	V	Ic/IB=3A/0.15A ✻
			—	—	1.5	V	Ic/IB=4A/0.2A ✻
DC current transfer ratio	2SC5103	hFE	82	—	270	—	VCE/Ic=2V/1A
	2SC4596		100	—	320	—	
Transition frequency		fT	—	120	—	MHz	VCB=10V , IE=0.5A , f=30MHz ✻
Output capacitance		Cob	—	80	—	pF	VCE=10V , IE=0A , f=1MHz
Turn-on time		ton	—	—	0.3	μs	Ic=3A , RL=10Ω
Storage time		tstg	—	—	1.5	μs	IB1=−IB2=0.15A
Fall time		tf	—	0.1	0.3	μs	VCC≒30V

✻ Measured using pulse current.

(96-199-C314)